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ABSTRACT

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Cross- and Within-Domain Relations of Academic Motivation Among Middle and High School Students: Self-Efficacy, Task-Value, and Achievement Goals

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Abstract

Cross-domain relations of self-efficacy, task-value, and achievement goal orientations were examined among 424 Korean middle and high school students using confirmatory factor analysis. All motivational constructs demonstrated strong subject-specificity in both age groups. Strengths of between-domain associations differed substantially by individual constructs. Levels of performance-approach and performance-avoidance goals were most similar across domains, whereas those of task-value and task goals were more distinct across domains. Self-efficacy perceptions were moderately correlated across subjects. High school students' academic motivation was more differentiated than that of middle school students. Within-domain interrelations among these motivation constructs were generally consistent with previous research. More important, consistent patterns of relations were observed in four different academic domains within each age group.

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Contemporary academic motivation research tends to emphasize the distinctiveness of students' motivational orientation across different situations (Weiner, 1990). The emphasis on context-specificity is translated into motivation constructs being assessed in reference to specific academic tasks, activities, or domains of interest. Such assessment practices considerably improved accuracy of behavioral prediction by accounting for differences in individuals' beliefs and perceptions across diverse situations (Bandura, 1997; Mischel, 1977; Pajares, 1996). Despite its obvious and important advantages, assessing motivation in reference to particular tasks and domains makes it difficult to conjecture about the nature and magnitude of relations between student motivation in different contexts. Patterns of interrelations among motivation constructs observed in a particular domain also may or may not emerge in other academic domains. Meece (1994) aptly observed this when she mentioned, "although the domain specificity of these measures may increase their predictive validity (Assor & Connell, 1992), it is not clear how well the findings will generalize to other subject areas" (p. 37).

The present research pursued two primary purposes in light of these observations. The first objective was to investigate the "cross-domain" relations of student motivation. This study examined how motivation constructs such as self-efficacy, task-value, or achievement goal orientations in one subject domain relate to the same construct assessed in the contexts of different academic subjects. Specific school subjects were chosen as the basic measurement level because they are known to act as principal psychological organizers of school-related cognition and affect (Gottfried, 1985; Marsh & Yeung, 1996). The second objective of this study was to examine the "within-domain" relations of these motivational constructs. Interrelations among self-efficacy, task-value, and achievement goal orientations were investigated in four different academic domains. It was of particular interest to determine whether there is any notable difference in these construct relations as a function of domains. The present research also allowed comparison of relevant findings across middle and high school samples.

Cross-Domain Relations of Motivation Constructs

Among a host of academic motivation constructs, the issue of cross-domain association has been most frequently probed with academic self-concept (e.g., Byrne & Shavelson, 1986; Marsh, Byrne, & Shavelson, 1988; Marsh, 1990, 1992). Using confirmatory factor analytic techniques, researchers have shown that students' self-evaluations contain strong subject-specific components. Yet these subject-specific self-concepts were highly correlated within the broader boundaries of verbal and math domains, attesting to the hierarchical nature of academic self-concept. Unfortunately, it is difficult or even dangerous to apply these findings directly to other ostensibly related constructs without empirical testing (Bong, 1996). For example, whereas self-concepts are clearly divided along the line of verbal and math domains, self-efficacy beliefs in these two areas are often highly correlated (Bong, 1997; Marsh, Walker, & Debus, 1991). Although whether and how these two constructs differ is beyond the scope of the present investigation (interested readers refer to Bong & Clark, 1999), this demonstrates the need to study the between-domain relations separately for each motivation construct (Gottfried, 1985).

Cross-Domain Relations of Self-efficacy

Academic self-efficacy refers to students' beliefs about their capabilities to perform given academic tasks at designated levels (Schunk, 1991). The standard method used in self-efficacy research is to assess students' confidence toward specific tasks and examine how well

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these perceptions predict performance on the very tasks. The task-specific self-efficacy appraisal methods sometimes leave researchers with the false impression that beliefs of self-efficacy are only relevant in the context of carrying out a single minute task. Quite the contrary, however, self-efficacy researchers acknowledge that one can face a wide range of tasks and situations with comparable self-efficacy and that perceptions of efficacy developed toward a particular task may generalize to other tasks of interest (Bandura, 1997; Pajares, 1996; Schunk & Swartz, 1993; Smith, 1989).

Bong (1997) provided evidence that students' self-efficacy judgments contain strong subject-specific components. As was the case with self-concept, some of these subject-specific efficacy perceptions were highly correlated, showing a certain degree of between-domain generalization. According to Bandura (1997), individuals are likely to generalize their self-efficacy when different activities share similar subskills, when skills in dissimilar domains are developed concurrently, when generic self-regulatory capabilities are acquired, when powerful personal triumphs are experienced, or when commonalties across diverse activities and situations are cognitively structured. Skills taught in different school subjects often share similar subskills, especially when these skills are dependent upon strong linguistic or quantitative competencies. Most skill development in school also takes place concurrently and is in large part based on common self-regulatory capabilities. The present study sought to replicate Bong's findings on the generality and hierarchical nature of self-efficacy beliefs with different measures.

Cross-Domain Relations of Task-Value

Eccles and her colleagues define task-value as an incentive for engaging in different tasks (Wigfield & Eccles, 1992; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield, Eccles, Yoon, Harold, Arbreton, Freedman-Doan, & Blumenfeld, 1997). Interest in and perceived importance and usefulness of the tasks comprise important dimensions of subjective task-value. Research found that children as young as first grade distinguish their perceptions of task-value toward different activity domains such as reading, math, music, and sport (Eccles et al., 1993; Wigfield et al., 1997). Although these results are certainly indicative, there is not enough evidence in the literature that permits sound speculation regarding the between-domain associations of academic task-value among adolescents. There are several reasons for this. First, researchers have been more interested in the internal composition of the construct such as interrelations among importance, usefulness, interest, and cost. Second, investigations on task-value have been conducted mostly in English or math, seldom including other subject areas. Third, studies that assessed task-values across multiple domains typically involved younger children. Hence, it is difficult to generalize these results to middle and high school students. In a longitudinal study with young adolescents, Wigfield, Eccles, Mac Iver, Reuman, and Midgley (1991) found that students' liking of math and English correlated .07, whereas their self-concept of ability in these two subjects correlated .37. Given that intrinsic interest represents one of the major facets of task-value, these findings suggest that the cross-domain associations of task-value may be weaker than those of other constructs.

Cross-Domain Relations of Achievement Goal Orientations

As was the case with task-value, the cross-domain relations have not been dealt with adequately with respect to various achievement goal orientations. Achievement goals commonly refer to reasons for engaging in achievement-oriented behaviors (Ames, 1984; Dweck, 1989; Nicholls, 1984; Urdan & Maehr, 1995). Students are said to demonstrate task or mastery goals when they undertake challenging academic tasks for the sake of learning and

mastering them and, by doing so, improving their competence. In contrast, students are believed to adopt performance or ego goals when they are overly conscious about how others might evaluate them. Those with performance-approach orientations try to validate their superior ability, whereas those with avoidance orientations strive to conceal their incompetence. Most research on achievement goals to date have been occupied with effects and relationships of different goals within a single academic context.

Duda and Nicholls (1992) is one of few studies that examined the between-domain associations of goals. They assessed high school students' task, ego, and work avoidance goals across classroom and sport. Students displayed similar goal orientations in these two areas. More interesting, cross-domain relations were considerably stronger with achievement goals (r = .51 to .67) than with perceived ability (r = .32) or satisfaction/enjoyment (r = .15). The investigators argued that goals should generalize more than perceived ability or satisfaction/enjoyment because goals reflect "the type of quality of one's personal criteria of success" (p. 291). While this study showed the existence of some generality in students' goals, its distinction between contexts of schoolwork and sport is nonetheless too broad. Consequently, its results cannot tell us much about the associations of achievement goals across different "academic" domains.

Goal adoption is influenced by students' views of ability as well as salient evaluation criteria (Dweck, 1989; Nicholls, 1984). Compared with younger children, older students tend to endorse differentiated conceptions of ability in which effort is viewed as an antonym of ability. School environments in which they function also emphasize normative superiority. We may thus expect strong cross-domain associations of performance goal orientations across different academic contexts. Whether the task goal orientation will also show similar cross-domain covariation remains to be seen.

Age Differences in Cross-Domain Relations

It is generally agreed that even very young children differentiate their beliefs of competence and task-value in different domains of functioning (e.g., Eccles et al., 1993; Marsh, Craven, & Debus, 1991; but see Harter & Pike, 1984). Studies with middle and high school students often assess students' motivational orientations toward specific academic domains with an understanding that they hold more or less differentiated perceptions in these different areas. What we do not yet know is how these specific beliefs relate to each other and how such relations change with age. In the present study, high school students were hypothesized to demonstrate relatively more distinct motivational beliefs compared with middle school students. They have more academic experience which can help them better attune to the demands and possibilities of each domain, which would in turn contribute to finer differentiation between domains. In particular, high school students are believed to hold more differentiated task-value beliefs compared with middle school students, due to their heavier concern on future college majors and career choices.

Within-Domain Relations of Motivation Constructs

Within-domain relations among motivation constructs have often been subjected to empirical interrogation. Achievement goals of mastery are typically positively related to the sense of self-efficacy (Meece, Blumenfeld, & Hoyle, 1988; Middleton, Kaplan, & Midgley, 1998; Middleton & Midgley, 1997; Roeser, Midgley, & Urdan, 1996; Skaalvik, 1997; Turner, Thorpe, & Meyer, 1998). Task goal orientations also work to increase intrinsic motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). Perceived competence and intrinsic motivation such as task-value are positively correlated (Berndt & Miller, 1990; Feather, 1988;

Meece, Wigfield, & Eccles, 1990). Because the positive interdependence among task goal orientation, self-efficacy, and task-value has been well documented, it leaves little question about the task goals' relations with other motivational constructs.

Performance-oriented goals' links to other motivation constructs are more problematic. Roeser et al. (1996) observed that students' task and relative ability goals were positively correlated and that there was no direct effect of personal relative ability goals on self-efficacy. In contrast, Turner et al. (1998) reported that learning goals and ability goals were inversely related to each other. Learning goals exercised direct positive effects on self-efficacy, whereas ability goals demonstrated indirect negative effects on self-efficacy through its direct effects on negative affect after failure. As Middleton and Midgley (1997) pointed out, this inconsistency might have been due to the failure of separating two different aspects of performance- or ability-focused goals. Middleton and Midgley as well as others (e.g., Elliot & Harackiewicz, 1996; Skaalvik, 1997) demonstrated that performance-orientation can be reliably differentiated into what were termed as performance-approach (self-enhancing) and performance-avoidance (self-defeating) goals.

Contrary to the earlier hope, the interrelations of performance orientations to other constructs have not become clearer enough with this distinction. In Middleton and Midgley (1997), for example, neither performance-approach nor performance-avoidance goals demonstrated a significant relation with task goals. The two performance goals positively correlated with each other. In Skaalvik (1997), performance-approach and avoidance goals were again positively correlated. However, performance-approach goals now showed a significant positive correlation with task goals. Elliot and Church (1997) reported similar within-goal relations. In addition, whereas the relation of performance-approach goals to self-efficacy was nonsignificant and that of performance-avoidance goals was negative in Middleton and Midgley, the former was positive and the latter was nonsignificant in Skaalvik. Still in Elliot and Church, performance-approach goals were positively correlated with competence expectancy, while performance-avoidance goals were negatively correlated with the same variable. The present research aimed to provide yet another empirical evidence on the within- and between-construct relations of achievement goals, along with consistency of these relations across domains and school levels.

The present investigation contributes to the current academic motivation research in several ways. More specifically, it can demonstrate (a) the degree of between-domain associations of popular and important motivation constructs, (b) the nature of within-domain relations of these constructs, (c) stability of their interrelations across different academic areas, and (d) potential age-related differences in both the generality and interrelations.

Method

Participants and Procedures

Four-hundred and twenty-four students (50% girls) from three middle schools and two high schools in Seoul and Kyung-gi Province in the vicinity of Seoul, Korea, participated. There were 229 middle school students (48% boys, 52% girls; 49% freshmen, 49% sophomores, 2% seniors) and 195 high school students (53% boys, 47% girls; 54% freshmen, 46% sophomores). Very few middle and high school seniors participated in this research because senior years are typically devoted to preparing for important nation-wide entrance examinations. Data were collected as part of a larger research project on school information literacy. Students completed the motivation questionnaires during regular classroom hours. They were assured of confidentiality of their responses.

Measures

The current study used scales that are well established by previous research. All measures were assessed with respect to Korean, English, mathematics, and science. Items were strictly parallel across the four academic subjects. Students rated each statement using a scale ranging from 1 (not at all true) to 5 (very true). For consistency, the same response format was used throughout the survey.

Self-efficacy. Subject-level academic self-efficacy items were adapted from the Patterns of Adaptive Learning Survey (PALS) (Middleton & Midgley, 1997; Roeser et al., 1996) as well as the self-efficacy subscale of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & De Groot, 1990). The five self-efficacy items were "I can master even the hardest material in (a specific subject) if I try," "I can do almost all the work in (a specific subject) if I don't give up," "I'm certain that I can do an excellent job on the problems and tasks assigned for (a specific subject) class," "I know that I will be able to learn the material for (a specific subject) class," and "I'm confident that I will receive a good grade in (a specific subject) this semester."

Task-value. Three items queried how much value students attached to learning each of the four school subjects. As in previous research (e.g., Berndt & Miller, 1990; Pokay & Blumenfeld, 1990), task-value was operationalized as encompassing perceived importance, perceived usefulness, and intrinsic interest in the subject. Items read "I think what I learn in (a specific subject) class is important," "I think (a specific subject) is a useful subject," and "I find (a specific subject) interesting."

Achievement goals. Orientations toward task, performance-approach, and performance-avoidance goals were assessed with three items each. Achievement goal items were adapted from the PALS. Task goal items read "I like problems and tasks that I can learn from during (a specific subject) class, even if I make a lot of mistakes," "The main reason why I study (a specific subject) is because I like it[1]," and "In (a specific subject), I like problems and materials the best that really make me think." Items for the performance-approach goal were "I feel good if I'm the only person who can answer the teacher's question in (a specific subject) class," "I would like to show my (specific subject) teacher that I am smarter than the other students," and "I feel successful in (a specific subject) when I get better grades than others." Those for the performance-avoidance goal were "The reason I study (a specific subject) is so the teacher doesn't think that I know less than others in my class," "One of my main goals in (a specific subject) class is to avoid looking like I'm stupid or I do worse than others in my class," and "I worry about doing worse than the other students in my class."

Overview of Data Analysis Strategy

Confirmatory factor analysis (CFA) provides an effective means to test both the cross- and the within-domain interrelatedness of motivational constructs. In the present research, each survey item functioned as an indicator and was hypothesized to load on the only factor it was intended to measure. To probe the cross-domain associations of each motivation construct, a basic first-order CFA model with four subject-specific latent factors was fitted to the data. When this model demonstrated acceptable fit, statistical significance and magnitude of correlation coefficients among subject-specific factors were examined. Two higher-order models were imposed upon observation of substantial first-order factor correlations (see Figure 1). Decisions regarding the absolute and relative effectiveness of CFA models were made on the basis of multiple goodness-of-fit indexes as well as model parsimony. All CFAs were performed separately with middle and high school samples to determine age-related variations. Therefore, testing for the cross-domain relations could involve up to 30 analyses (i.e., 5 constructs × 3 models × 2 samples) and their post-hoc modifications, if necessary.

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For within-domain relations of motivation, a CFA model with correlated motivation factors were fitted within the context of each academic domain. Statistical significance and magnitude of correlation coefficients among motivation factors were examined along with goodness-of-fit indexes. Patterns of factor interconnectedness were compared across domains for consistency. Again, all CFAs were performed separately with middle and high school samples to discover age-related discrepancy. Testing for the within-domain relations thus involved 8 analyses (i.e., 4 domains × 2 samples). All CFAs were performed with the EQS program (Bentler, 1992).

Results

Table 1 reports descriptive statistics of the scales. All scales demonstrated acceptable reliability with standardized coefficient αs ranging above .70 (Mdn = .80). Zero-order correlation coefficients among measures are presented in Table 2.

Cross-Domain Confirmatory Factor Analysis

First-order CFA. Because items with parallel wording were used across the four school subjects, correlated uniquenesses (CUs) were incorporated to estimate construct relations more accurately (Marsh, Byrne, & Yeung, 1999). In almost all models, adding CUs between parallel items considerably improved the model fit. In the case of academic self-efficacy, four additional CUs (i.e., between the first and second indicators across the four subjects) were needed to achieve satisfactory model fit with both middle and high school samples. The two self-efficacy items requiring CUs dealt with overcoming difficulties with effort and persistence.

Three a priori CFA models were posited (see Figure 1). Model A was a basic first-order factor structure where each indicator loaded on a single factor and where all factors were presumed to be correlated. Because each survey item served as a measured variable (MV), there were three MVs for subject-specific factors of task, performance-approach, and performance-avoidance goals and perceived value. Five MVs were available for subject-specific academic self-efficacy factors. The four subject-specific factors were hypothesized to correlate with one another. The Bentler-Bonnet nonnormed fit index (NNFI), comparative fit index (CFI), and magnitude of residuals were considered along with the chi-square statistics in determining the model fit.

As Table 3 presents, Model A demonstrated very good fit to the empirical data with all motivational constructs being considered, with both middle and high school samples. Most chi-square values had probability levels greater than .05, indicating that the hypothesized model did not differ significantly from the empirical data. Exceptions were academic self-efficacy (both $ps < .001$) and high school performance-avoidance goal models ($p < .05$). But even in these models, ratios of chi-square values to their degrees of freedom were satisfactory (2.24 being the largest). Also, all NNFI and CFI values were well above .90 with magnitude of residuals ranging below .05 (Mdn = .033).

As can be seen from Table 4, none of the first-order factor correlation approached 1, adding to the multidimensionality or subject-specificity of these motivational constructs. With the middle school sample, median values of correlation coefficients were .55 for self-efficacy, .46 for task-value, .47 for task goal, .67 for performance-approach goal, and .67 for performance-avoidance goal. Median coefficients with the high school sample were .42, .25, .13, .52, and .51, respectively, in the same order. Overall, magnitude of factor correlation tended to decrease in the high school sample compared with the middle school sample. This tendency was more pronounced for some constructs than the others. In particular,

whereas middle school students' subject-specific task goal factors were all significantly correlated, only the correlations between Korean and English and between math and science factors reached significance with the high school sample. Correlations of task goal factors in verbal subjects (i.e., Korean and English) with those in quantitative subjects (i.e., math and science) all dropped to nonsignificance. Noteworthy reduction in factor correlations from the middle to the high school sample was also observed with task-value factors. Compared with those in the middle school sample, the correlations between Korean and math and between Korean and science task-value factors fell substantially in the high school sample.

Higher-order CFA. Because that Model A demonstrated acceptable fit and that significant correlations among first-order factors were obtained for most motivational constructs, higher-order structures were subsequently imposed. Model B specified verbal and quantitative second-order factors. It postulated that at least two higher-order factors were necessary to effectively account for relations among subject-specific motivation factors. Model C, in contrast, specified a general factor underlying all four subject-specific factors. It was based on the premise that all subject-specific motivation factors shared a sizable amount of variance through a common higher-order factor. Among Models A, B, and C, Model A should demonstrate the best fit because it is the least constrained of the three. If Models B or C displays comparable fit to Model A, they should be preferred to Model A because of their relative parsimony.

There is little reason to test higher-order structures when first-order factors are not sufficiently correlated. Goodness-of-fit indexes such as NNFI and CFI of higher-order models can be misleading because they reflect the capability of the entire model with both lower- and higher-order factors to account for variances among indicators. One way to ascertain the necessity of lower-order factor correlation in model definition is to compare the fit of correlated and uncorrelated lower-order factor structures (Marsh, 1990; Vispoel, 1995). This basic test resulted in statistically significant ($p < .05$) chi-square difference statistics for all constructs in the present research, attesting to the indispensability of first-order factor correlations. The target coefficient (TC) is another useful index that reflects the proportion of lower-order factor variances that is accounted for by the higher-order factors (Marsh & Hocevar, 1985). As with other fit indexes, values of TC greater than .90 are generally considered acceptable. The TC was examined along with conventional fit indexes in determining the adequacy of higher-order structures. Although the degree of first-order factor correlation was, on the whole, sufficient to warrant higher-order analysis, some of the task goal and task-value factors of the high school sample demonstrated nonsignificant relations with each other. Consequently, testing for a general factor model (i.e., Model C) for these constructs cannot be justified with the high school sample. Nevertheless, results for both Models B and C were presented for all motivational constructs for the sake of completeness.

For self-efficacy, results of higher-order CFAs differed between the middle and high school samples. With the middle school self-efficacy data, all goodness-of-fit indexes including the TC were acceptable and identical across Models B and C (see Table 3). Nonetheless, the correlation coefficient between the verbal and quantitative second-order factors of Model B was .96, almost approaching 1 (see Table 5). The general second-order factor of Model C was clearly defined by all four first-order factors (see Table 6). Together with consideration of model parsimony, Model C should be viewed as the best representation of the middle school sample's self-efficacy data. With the high school self-efficacy data, Models B and C again showed similar fit indexes. In contrast to the middle school data, however, the correlation between the verbal and quantitative factors of the high school sample was only .77. Table 6 also shows that the general factor of Model C was not well represented by the Korean and English first-order factors. In particular, roughly 78% of the

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Korean (i.e., 1-[.46]^2) factor variances remained unaccounted for by the general second-order factor. When two separate second-order factors were included in Model B, loadings of the Korean and English first-order factors improved noticeably, bringing considerable reduction in their residual variances. Model B is hence considered the better illustration of the high school self-efficacy data.

Next, higher-order CFA results for the middle school task-value were examined. Both Models B and C showed satisfactory fit indexes, with Model B demonstrating slightly better fit (see Table 3). Tables 5 and 6 reveal that all higher-order factors were well defined by their first-order factors with substantial loadings. The correlation coefficient between the second-order verbal and quantitative factors of Model B was .84. Given that this correlation was corrected for unreliability and thus represented the highest end of possible correlation coefficients that these data could afford, keeping the two correlated second-order factors seemed warranted. Accordingly, Model B was viewed as the more accurate description of the middle school task-value data than Model C. Results for the high school task-value will not be discussed for the aforementioned reason.

With the middle school sample's task goal, goodness-of-fit indexes and TCs of both Models B and C were outstanding and virtually the same (see Table 3). Although specifying two second-order factors somewhat improved the paths from the Korean and English first-order factors to their higher-order factor (see Table 5 and 6), these increments were not as substantial as they were in the case of self-efficacy. Moreover, the correlation coefficient of .92 between the second-order verbal and quantitative factors of Model B raises a question on their discriminant validity. Model C is also more parsimonious than Model B. Therefore, Model C should be considered as the most effective representation of the middle school task goal data. Again, results for the high school task goal are not discussed.

Similar results were obtained with the middle school performance-approach goal. Fit indexes were almost identical between Models B and C, and both models demonstrated excellent TCs (see Table 3). The high correlation (.94) between the verbal and quantitative factors of Model B (see Table 5) and parsimony consideration render Model C as the best representation of middle school performance-approach goal data. With the high school sample, however, different conclusion is called for. Only Model B was associated with the TC greater than .90, which is also superior than that of Model C. Loadings of the Korean and English first-order factors on their verbal second-order factor in Model B showed sizable improvement from those on the general second-order factor in Model C. The correlation coefficient between the verbal and quantitative factors was .70, supporting the separation of the two second-order factors.

In the case of performance-avoidance goal, both middle and high school samples demonstrated analogous patterns. Both Models B and C showed acceptable TCs but those of Model B were superior than those of Model C (see Table 3). The verbal and quantitative factors of Model B as well as the general second-order factor of Model C were adequately defined by their lower-order factors (see Tables 5 and 6). However, specifying two second-order factors accounted for considerably more variance in their first-order factors. As was the case with self-efficacy, loadings of the Korean and English factors improved substantially in Model B compared with those in Model C. Although this phenomenon held true with both middle and high school samples, it was especially conspicuous in the high school sample. Moreover, the correlation coefficients between the verbal and quantitative factors were less than .90, substantiating their independent specification. Therefore, Model B is considered the most suitable hierarchical representation of both middle and high school sample's performance-avoidance goal orientations.

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Within-Domain Confirmatory Factor Analysis

Interrelations among self-efficacy, task-value, and achievement goals were explored by CFA. Of particular interest here were the relations of achievement goal orientations to other motivation constructs and stability of these relations across different academic domains and age groups. As in the cross-domain CFAs, each MV was hypothesized to load on a single a priori factor. CU paths were added between the first two self-efficacy variables. The five motivation factors--self-efficacy, task-value, task goal, performance-approach goal, and performance-avoidance goal--were hypothesized to correlate with one another. Analyses were conducted separately for each of the four school subjects. The same factor structure was imposed separately on the middle and high school data within each domain. The NNFI, CFI, and magnitude of residuals were considered along with the chi-square statistics in determining the model fit. As Table 7 shows, high school models in English, math, and science were associated with satisfactory goodness-of-fit indexes. Other models demonstrated marginal but acceptable overall fit to the empirical data.

Table 8 presents correlation coefficients among motivation factors by domain and school level. As in previous research, self-efficacy and task-value factors were significantly and positively correlated with each other, both across domains and school levels. Also consistent with previous research, the task goal factor showed significant positive correlations with the self-efficacy and task-value factors in all four school subjects for both age groups. The significant positive correlation between performance-approach and performance-avoidance goals, consistently observed in previous findings, was also witnessed across domains and school levels. Consistent with Skaalvik (1997) and Elliot and Church (1997), positive correlations were observed between the performance-approach goal and self-efficacy and between the task and performance-approach goal factors, regardless of domain or age. The performance-approach goal factor also showed positive relations with the task-value factor.

Relations of the performance-avoidance goal with other factors were not as unequivocal. With the high school sample, the performance avoidance goal factor showed a nonsignificant correlation with self-efficacy in all school subjects but science. Skaalvik (1997) as well reported a nonsignificant relationship between the two, whereas Middleton and Midgley (1997) and Elliot and Church (1997) reported a negative relationship. Also with the high school sample, the performance-avoidance goal was not significantly related to either the task-value or the task goal factor across the four domains. The nonsignificant relation of the performance-avoidance goal with the task goal is consistent with previous research. In general, the performance-avoidance goal factor exhibited empirical independence from all but the performance-approach goal factor in the high school sample.

Somewhat puzzling results were obtained with the middle school sample. The performance avoidance goal factor demonstrated significant positive relations with both the self-efficacy and task-value factors in all domains but Korean. It was also positively correlated with the task goal factor in all school subjects. In previous research, performance-avoidance goals typically showed from negative to nonsignificant relations with these more adaptive motivational states. The performance-avoidance goal's relations to other motivation factors thus constituted the most conspicuous difference between the middle and the high school samples as well as between the previous and the present research. There were other minor differences between the two age groups. For example, relations of the task goal with the task-value factors were uniformly stronger in the high school sample than the middle school sample. Relations of the performance-approach goal with the self-efficacy factor, on the other hand, were considerably higher for the middle school sample than the high school sample across the four academic domains.

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Discussion

Subject-Specificity and Cross-Domain Relations of Academic Motivation

The current results provide strong empirical support for the subject-specificity of self-efficacy, task-value, and various achievement goals. Both middle and high school students expressed motivational orientations that were sufficiently distinct--albeit correlated--across the core school subjects examined in this research. For each of these motivational constructs, four a priori subject-specific factors emerged. These first-order factors were clearly defined by their respective items with statistically significant and sizable factor loadings. The subject-specific factors were, on average, moderately correlated among themselves. Although there were some notable differences in the magnitude of these relations by construct and age, none of the correlation coefficients was large enough to cast doubt on the multidimensional nature of academic motivation. These results are consistent with the existing theory and research and demonstrate further that specific school subjects indeed function as an important organizational framework for school-aged children and adolescents' motivation (Gottfried, 1985, 1990; Marsh & Yeung, 1996; Simpson, Licht, Wagner, & Stader, 1996).

Strengths of cross-domain relations differed substantially by individual construct. Performance-approach and performance-avoidance goals demonstrated the strongest between-domain associations, whereas task-value and task goals showed the weakest correlation. Self-efficacy perceptions were moderately correlated across subjects, consistent with previous findings (Bong, 1997). Although students' desire to impress teachers, to outperform peers, or to avoid negative judgments from others was specific to each school subject, it was nonetheless the least affected by the individual subject matter in comparison with other motivational orientations. Stated differently, students who express performance-approach or performance-avoidance goals in one academic situation appear more likely to pursue similar goals in other achievement contexts. Ames (1992) argued that one of the most salient classroom factors that affect student motivation is evaluation practices. As students progress from elementary to middle and to high schools, evaluation standards become increasingly product oriented with a stronger emphasis on social comparison. School and classroom contexts that stress normative success in turn orient students to performance goals (Anderman & Midgley, 1997; Roeser et al., 1996). The relatively stronger cross-domain correlations of performance-approach and performance-avoidance achievement goals suggest that adoption of these two goals largely depend on students' individual susceptibility to normative concerns that are ubiquitous in their school environment.

How much value students attach to the subject matter and their preferences toward task mastery and challenge in the subject were, in contrast, more distinct across domains. In particular, high school students demonstrated task goals that were clearly differentiated between subjects. This extreme domain-specificity of task goal orientation contradicts the view that achievement goal orientations originate from stable personal dispositions (Duda & Nicholls, 1992; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997). Rather, results from the present investigation indicate that importance, usefulness, and intrinsic interest students perceive in the school subject may play a more meaningful role in guiding students to the task goal adoption. As expected, high school students' task-value perceptions were clearly differentiated across diverse subjects, presumably due to their imminent concern on occupational choices. Not only did task goal orientation show a similar pattern of cross-domain associations to that of task-value, interrelation between these two constructs became much stronger among the high school students than among the middle school students. One of the unanswered questions in the achievement goal research is where the goals come from (Urdan & Maehr, 1995). Although covariation does not imply causation, these results point to

the need to investigate whether the task and performance goals are differentially affected by different sources.

Differences in the cross-domain associations in turn determined the suitability of hypothesized hierarchical representations for each motivation construct. A hierarchical structure with the general second-order factor most effectively illustrated relations among middle school students' self-efficacy, task goals, and performance-approach goals in the four school subjects. That a general factor taps all lower-order factors should not be taken as evidence that the particular construct lacks domain-specificity (Bong, 1997; Marsh, 1990). Quite the contrary, 23% to 69% (i.e., 1-[factor loading]^2) of the variance in the subject-specific factors of these constructs were unique to themselves, thus left unaccounted for by the higher-order factor. The good fit demonstrated by the general factor model simply suggests that these early adolescents expressed perceptions of self-efficacy, task goals, and performance-approach goals that were fairly similar across different content areas. Middle school students' value perceptions and performance-avoidance orientations and high school students' self-efficacy, performance-approach goals, and performance-avoidance goals were better represented by a hierarchical structure with separate verbal and quantitative second-order factors.

As discussed earlier, high school students' subject-specific task-value and task goal perceptions in the four academic subjects were too weakly correlated to render any hierarchical representation acceptable. Therefore, assessing these constructs beyond the level of specific school subjects may be highly inappropriate at least for late adolescents. In general, high school students demonstrated more differentiated motivational beliefs than middle school students. This pattern was unanimous across the five motivation constructs considered in this study. The difference between the two age groups is mostly due to the high school students' clearer distinction between primarily verbal and primarily quantitative subjects. A single general higher-order factor left much of the variance in the first-order Korean and English factors unaccounted for in the case of self-efficacy, performance-approach, and performance-avoidance orientations of high school students. In all these instances, specifying two second-order factors substantially reduced the residual variances in the verbal area. On a broad level, the increased differentiation of academic motivation demonstrated by high school students corroborates findings from the self-concept research. Shavelson, Hubner, and Stanton (1976) argued that "With increasing age and experience (especially acquisition of verbal labels), self-concept becomes increasingly differentiated" (p. 414). Similar mechanisms may be at work with other motivational constructs.

As Marsh and Yeung (1998) pointed out in their discussion of the self-concept literature, results from the higher-order factor analyses do not imply any direction of causality between the more specific and more general components. The present results certainly do not indicate that the subject-specific factors can be safely inferred from the higher-order factors. Neither do they suggest, as Bong (1997) warned, that the more general factors can substitute the subject-specific factors or function the same way the more specific factors do. The results merely demonstrate that some motivational constructs appear to be more hierarchically structured than others and that the nature of this hierarchy differs between different constructs and age groups. Perhaps the most pressing need for future research in this area involves uncovering the psychological grounds that create such a hierarchy and its change thereafter. Heightened evaluation concerns, consideration of majors and careers, differentiated interest, and acquisition of prevalent categorization schemes are all viable explanations for the increased differentiation of academic motivation. However, whereas some of these mechanisms may be relevant to most academic motivation constructs, others seem pertinent mainly to a subset of these constructs. More research is needed on the social cognitive

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processes underlying the differentiation of each motivation constructs and on the differences in students' behavioral intentions before and after such differentiation occurs.

Consistency of Within-Domain Relations of Academic Motivation

Consistent with previous results (e.g., Berndt & Miller, 1990; Elliot & Church, 1997; Ethington, 1991; Meece et al., 1990; Middleton & Midgley, 1997; Pokay & Blumenfeld, 1990; Skaalvik, 1997), academic self-efficacy, task-value, and task goal perceptions in this study were positively correlated in all school subjects among both middle and high school students. Also consistent with previous findings, performance-approach and performance-avoidance goals showed a significant positive relation across domains and school levels. Performance-approach goals also demonstrated positive correlations with self-efficacy, task-value, and task goal orientations. These latter findings challenge Nicholls's (1984) earlier claim that ego goals work to lower intrinsic motivation. More recent research based on the differentiated conception of achievement goals into approach and avoidance motives argues for the facilitative effects of performance-approach goals (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Skaalvik, 1997; but see Middleton & Midgley, 1997). The current results provide additional evidence in support of the approach--avoid distinction. The evidence is especially powerful because the positive associations of performance-approach goals to other adaptive motivational orientations were observed across multiple academic domains and different age levels.

Overall, the present research revealed more similarities than differences in the interrelations of motivational constructs. Only few studies have examined the uniformity of motivation relations across diverse achievement contexts as did the current study (Gottfried, 1985; Mac Iver, Stipek, & Daniels, 1991; Meece et al., 1988). These studies generally report a reasonable degree of consistency in construct relations, sometimes despite appreciable differences in mean level motivation across domains. For example, Mac Iver et al. (1991) found that although there were significant mean differences in within-semester changes of intrinsic value, utility value, self-concept of ability, and effort investment across course types, relations among these changes were nonetheless parallel in different courses such as English, math, social studies, science, and other elective subjects. The current results were compatible with their findings in that self-efficacy, task-value, and achievement goals in discrete domains, within each age group, showed a very similar pattern of interconnectedness.

In contrast to the remarkable cross-domain resemblance, there were several age-related differences in how one motivation construct relates to the others. The most marked difference involves the role of performance-avoidance goals. With high school students, performance-avoidance orientations demonstrated mostly nonsignificant relations with self-efficacy, task-value, and task goals across the four domains. The nonsignificant relationship of performance-avoidance goals with other positive motivational orientations has been reported previously (Middleton & Midgley, 1997; Skaalvik, 1997). Whether or not high school students would display avoidance orientations in a given subject was, therefore, independent of their perceptions of confidence, value, and mastery preferences in that subject. Oddly enough, however, middle school students' performance-avoidance goals showed significant positive relations with those same motivational constructs in all subjects except Korean. In other words, as these students feel more efficacious and perceive greater task-value in the given subject, they not only put forth effort to improve their competence and document their superior ability but also try hard to avoid looking incapable.

This finding can be understood in light of Mac Iver et al.'s (1991) observation. The researchers suspected that relations among important motivational constructs would differ between middle and high school students. Specifically, they reasoned that middle school

students would be influenced more by their willingness to please their parents compared with high school students, for whom utility value would play a more critical role. Perceived importance of extrinsic pressure indeed related significantly with increased effort among middle school students but not among high school students. Presumably, the young adolescents who participated in this research, too, possessed a strong desire to please significant adults, and this led them to manifest similar levels of approach and avoidance tendencies. The considerably stronger associations between both types of performance goals and perceptions of self-efficacy exhibited by middle school students are in line with this interpretation. Interestingly, middle school students' motivational patterns in Korean resembled those of high school students. Compared with other school subjects whose demand characteristics change dramatically as students transit to middle schools, Korean may be perceived by most Korean students as a relatively stable subject. This might have contributed to the middle school students' discrimination of Korean from other school subjects. The proposed relationship between task novelty/familiarity and performance orientation is speculative and warrants further probing.

The present research has several limitations that have implications for future work in this area. First, it only dealt with students' academic motivation in core academic subjects. A different conclusion may be reached when a more expanded set of school subjects are included. For example, Marsh and Shavelson (1985) found that two higher-order factors--verbal and math self-concepts--were sufficient to describe relations among lower-order self-concepts in the core academic subjects. However, additional higher-order factors were required to adequately represent the covariation among self-concepts in more diverse school subjects. Likewise, evaluation concerns would be significantly lower in domains that are viewed as less important. Between-domain associations of achievement goals may change accordingly. The results reported in this article, therefore, may be showing only part of the whole picture for each motivational construct. Second, the current study was conducted with Korean students. There may be important differences in motivational patterns between Korean or Asian students in general and Western students. Eaton and Dembo (1997) reported that fear of academic failure predicted achievement motivation of Asian American students but not that of their non-Asian peers. Although the results generally agree with the existing theory, their generalizability may be limited. Third, this article discussed several age-related differences. However, firm conclusions regarding developmental changes in motivation generality and interrelations should await a longitudinal investigation.

In summary, the present investigation confirmed the subject-specificity of academic motivation for middle and high school students. More important, it provided the first empirical evidence on the cross-domain associations of some of the most popular motivation constructs. These results should be consulted when researchers try to determine whether assessing a particular construct at a specified level can be justified. Another significant contribution of the present study is its finding that there were more age-related variations than domain-related variations in how these motivational constructs related to one another. It will be interesting to see whether this consistency of within-domain relations is maintained when more concrete outcomes such as task choice and performance enter the equation.

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Footnote

[1] Although this item is consistent with the present study's conceptual definition of achievement goals (i.e., reasons for engaging in achievement-oriented behaviors), it may nonetheless appear to overlap with one of the task-value items (i.e., intrinsic interest). Because item overlap works to inflate construct relations, additional 8 analyses were performed (i.e., 4 domains × 2 samples) with this particular item loading on the task-value factor instead of the task goal factor. Goodness-of-fit indexes of these subsequent models were all uniformly lower than the original models. Correlation coefficients among factors stay essentially the same with minor fluctuation. The only noticeable difference was in the relations between the task-value and the task goal factors of the middle school sample. However, these relations became stronger, not weaker, when the particular item was included as a task-value rather than a task goal item. Together, these results support the initial conceptualization of this item as a task goal orientation measure.

Table 1

Descriptive Statistics of Scales

	Middle School				High School				
	Boys (n = 109)		Girls (n = 120)		Boys (n = 103)		Girls (n = 92)		
Scale	M	SD	M	SD	M	SD	M	SD	α
Self-Efficacy									
Korean	3.43	.86	3.48	.82	3.19	.79	2.93	.93	.86
English	3.37	.89	3.43	.98	3.45	1.04	3.15	.96	.90
Mathematics	3.40	.96	3.07	1.01	3.43	1.08	3.16	.92	.91
Science	3.31	.96	3.06	1.01	3.46	1.01	3.12	.92	.91
Task-Value									
Korean	3.35	.88	3.42	.85	2.87	.92	2.67	.88	.81
English	3.58	.94	3.71	.92	3.52	1.02	3.37	.80	.75
Mathematics	3.31	.88	2.95	1.04	3.24	1.19	2.90	1.02	.80
Science	3.42	1.03	3.18	1.13	3.55	1.03	3.21	.93	.85
Task Goal									
Korean	3.17	1.00	3.38	.89	2.92	.89	2.88	.88	.73
English	3.20	.99	3.30	1.10	3.03	1.02	2.80	.93	.81
Mathematics	3.19	.93	2.80	1.07	3.35	1.17	3.08	1.01	.83
Science	3.20	1.09	3.01	1.10	3.33	1.11	3.13	.94	.84
Performance-Approach Goal									
Korean	3.19	.97	3.32	1.02	3.00	.99	2.64	.95	.71
English	3.21	.89	3.21	1.09	2.91	1.06	2.81	1.11	.76
Mathematics	3.17	.94	2.87	1.17	3.24	1.10	2.79	1.06	.79
Science	3.03	.95	2.94	1.12	3.10	1.08	2.78	1.07	.78
Performance-Avoidance Goal									
Korean	2.74	.94	2.31	.96	2.27	.89	2.12	.75	.77
English	2.80	.89	2.53	.99	2.42	.92	2.47	.93	.73
Mathematics	2.84	1.00	2.42	.93	2.59	1.04	2.52	.89	.75
Science	2.81	1.03	2.44	.97	2.47	.99	2.48	.97	.80

Table 2

Zero-Order Correlation Coefficients Among Measures

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Korean Self-Efficacy	--	.47	.54	.58	.63	.30	.38	.40	.57	.24	.39	.40	.54	.45	.42	.44	.01	.08	.18	.13
2. English Self-Efficacy	.39	--	.48	.44	.32	.69	.36	.34	.27	.70	.25	.40	.31	.58	.36	.39	.14	.16	.19	.15
3. Math Self-Efficacy	.27	.43	--	.59	.34	.38	.71	.36	.30	.35	.67	.49	.35	.45	.68	.43	.00	.09	.26	.20
4. Science Self-Efficacy	.40	.39	.59	--	.42	.37	.49	.74	.36	.37	.53	.73	.38	.47	.43	.65	.05	.01	.20	.21
5. Korean Task-Value	.58	.25	.05	.14	--	.40	.36	.38	.57	.29	.31	.37	.46	.40	.34	.38	.09	.20	.20	.12
6. English Task-Value	.23	.69	.24	.16	.27	--	.37	.35	.24	.62	.26	.41	.17	.45	.27	.27	.03	.16	.20	.12
7. Math Task-Value	.13	.33	.74	.43	.06	.17	--	.45	.29	.32	.66	.49	.17	.30	.49	.33	.07	.08	.27	.15
8. Science Task-Value	.24	.25	.48	.71	.11	.17	.44	--	.31	.32	.40	.70	.20	.28	.23	.50	.08	.08	.21	.24
9. Korean Task Goal	.57	.22	-.03	.13	.68	.19	-.08	.11	--	.36	.38	.45	.46	.28	.31	.33	.14	.14	.16	.12
10. English Task Goal	.25	.68	.17	.23	.27	.67	.16	.20	.27	--	.32	.46	.26	.57	.26	.33	.16	.16	.19	.14
11. Math Task Goal	.10	.24	.69	.33	.01	.19	.69	.42	-.04	.13	--	.57	.23	.34	.57	.39	-.05	.05	.22	.18
12. Science Task Goal	.25	.17	.51	.72	.12	.06	.40	.76	.18	.14	.48	--	.26	.36	.37	.58	.04	.06	.24	.22
13. Korean Performance-Approach Goal	.44	.22	.12	.09	.35	.17	.09	.06	.35	.21	.11	.05	--	.58	.53	.54	.15	.17	.16	.21
14. English Performance-Approach Goal	.22	.51	.27	.14	.15	.44	.23	.06	.06	.49	.22	.07	.56	--	.56	.61	.20	.32	.27	.21
15. Math Performance-Approach Goal	.17	.20	.53	.28	.03	.12	.51	.25	-.03	.05	.57	.30	.48	.50	--	.64	.13	.24	.30	.23
16. Science Performance-Approach Goal	.23	.08	.35	.45	.11	.06	.25	.41	.05	.05	.31	.52	.41	.44	.67	--	.22	.19	.32	.40
17. Korean Performance-Avoidance Goal	-.02	-.06	-.08	.03	.05	-.05	-.01	-.05	-.06	.01	-.02	.03	.20	.12	.15	.22	--	.62	.49	.58
18. English Performance-Avoidance Goal	-.02	.00	-.02	-.03	.02	.12	-.00	-.05	-.12	-.05	-.01	-.03	.10	.23	.18	.18	.58	--	.57	.52
19. Math Performance-Avoidance Goal	.04	-.02	.10	.14	-.05	.02	.07	.12	-.10	.00	-.04	.04	.06	.13	.28	.33	.44	.43	--	.68
20. Science Performance-Avoidance Goal	-.04	-.03	.10	.19	-.10	-.03	.08	.11	-.13	-.01	.05	.09	.05	.18	.29	.45	.47	.44	.69	--

Note. Middle school sample (N = 225) above the diagonal; high school sample (N = 195) below the diagonal. Coefficients greater than .13 (.14) in absolute value is significant at $p < .05$ for the middle (high) school sample.

Table 3

Goodness-of-Fit Indexes of Cross-Domain Confirmatory Factor Analysis Models

	Middle School						High School					
Model	χ^2	df	NNFI	CFI	res.	TC	χ^2	df	NNFI	CFI	res.	TC
Self-Efficacy												
Model A	290.68	130	.93	.95	.040	1.00	266.55	130	.94	.96	.047	1.00
Model B	292.00	131	.93	.95	.041	.99	271.99	131	.94	.96	.050	.97
Model C	292.49	132	.93	.95	.041	.99	276.70	132	.93	.95	.053	.93
Task-Value												
Model A	33.82	30	.99	1.00	.026	1.00	36.36	30	.99	.99	.033	1.00
Model B	35.49	31	.99	1.00	.026	.99	36.55	31	.99	.99	.032	1.00
Model C	38.64	32	.99	.99	.030	.97	46.15	32	.97	.99	.043	.85
Task Goal												
Model A	41.97	30	.98	.99	.027	1.00	38.85	30	.98	.99	.037	1.00
Model B	43.34	31	.98	.99	.029	.99	47.31*	31	.96	.98	.044	.84
Model C	43.94	32	.98	.99	.030	.99	54.39*	32	.95	.98	.057	.70
Performance-Approach Goal												
Model A	40.29	30	.98	.99	.020	1.00	42.27	30	.98	.99	.032	1.00
Model B	40.58	31	.98	.99	.020	1.00	43.33	31	.98	.99	.033	.99
Model C	41.84	32	.98	.99	.020	.99	65.30	32	.94	.97	.045	.86
Performance-Avoidance Goal												
Model A	25.84	30	1.00	1.00	.016	1.00	45.54**	30	.97	.99	.034	1.00
Model B	32.92	31	1.00	1.00	.020	.97	45.64**	31	.97	.99	.033	1.00
Model C	49.73	32	.97	.99	.029	.91	69.12**	32	.94	.97	.048	.90

Note. All factor loadings and factor variances were significant at $p < .05$. NNFI = Bentler-Bonnett nonnormed fit index; CFI = comparative fit index; res. = average absolute standardized residuals; TC = target coefficient ([χ^2 for the model with no factor correlation - χ^2 for the model being tested]/[χ^2 for the model with no factor correlation - χ^2 for Model A]).

* Variance of one disturbance term was constrained to be 0. ** Variances of two error terms were not significant at $p < .05$.

Table 4

Standardized Path Coefficients for Model A

Path	Self-Efficacy		Task-Value		Task goal		Performance-Approach Goal		Performance-Avoidance Goal	
	Middle	High	Middle	High	Middle	High	Middle	High	Middle	High
1. Korean--English	.52*	.38*	.50*	.34*	.38*	.28*	.67*	.66*	.73*	.68*
2. English--Math	.51*	.44*	.46*	.25*	.34*	.11	.64*	.51*	.66*	.47*
3. Math--Science	.62*	.63*	.52*	.51*	.60*	.48*	.70*	.74*	.79*	.73*
4. Korean--Math	.58*	.24*	.44*	.14	.43*	-.14	.58*	.53*	.60*	.49*
5. English--Science	.47*	.43*	.36*	.24*	.50*	.10	.68*	.48*	.58*	.51*
6. Korean--Science	.62*	.41*	.46*	.17*	.50*	.14	.66*	.42*	.68*	.50*

* $p < .05$.

Table 5

Standardized Path Coefficients for Model B

Path	Self-Efficacy		Task-Value		Task Goal		Performance-Approach Goal		Performance-Avoidance Goal	
	Middle	High	Middle	High	Middle	High	Middle	High	Middle	High
1. Verbal to Korean	.80*	.55*	.74*	.47*	.63*	.27*	.79*	.80*	.88*	.82*
2. Verbal to English	.65*	.69*	.67*	.74*	.60*	1.00*	.84*	.81*	.84*	.83*
3. Quantitative to Math	.77*	.74*	.75*	.72*	.68*	.66*	.80*	.91*	.87*	.84*
4. Quantitative to Science	.80*	.85*	.68*	.71*	.89*	.72*	.87*	.81*	.91*	.87*
5. Verbal--Quantitative	.96*	.77*	.84*	.47*	.92*	.15	.94*	.70*	.83*	.70*

*$p < .05$.

Table 6

Standardized Path Coefficients for Model C

Path	Self-Efficacy		Task-Value		Task Goal		Performance-Approach Goal		Performance-Avoidance Goal	
	Middle	High	Middle	High	Middle	High	Middle	High	Middle	High
1. General to Korean	.78*	.46*	.69*	.28*	.59*	.12	.78*	.65*	.79*	.67*
2. General to English	.64*	.56*	.63*	.38*	.56*	.10	.82*	.65*	.77*	.67*
3. General to Math	.77*	.74*	.72*	.69*	.68*	.47*	.79*	.87*	.86*	.82*
4. General to Science	.79*	.84*	.66*	.71*	.88*	1.00*	.86*	.79*	.87*	.83*

* $p < .05$.

Table 7

Goodness-of-Fit Indexes of Within-Domain Confirmatory Factor Analysis Models

Domain	Middle School					High School				
	χ^2	df	NNFI	CFI	res.	χ^2	df	NNFI	CFI	res.
Korean	284.14	108	.86	.89	.05	274.47	108	.86	.89	.05
English	288.90	108	.88	.91	.05	253.41	108	.90	.92	.05
Math	298.02	108	.89	.92	.03	264.38	108	.91	.93	.04
Science	396.55	108	.86	.89	.04	240.57	108	.93	.94	.03

Note. All factor loadings and factor variances were significant at $p < .05$. NNFI = Bentler-Bonnett nonnormed fit index; CFI = comparative fit index; res. = average absolute standardized residuals.

Table 8

Standardized Correlation Coefficients Among Factors

Path	Korean		English		Math		Science	
	Middle	High	Middle	High	Middle	High	Middle	High
1. Self-Efficacy--Task-Value	.77*	.65*	.80*	.85*	.85*	.87*	.81*	.84*
2. Task Goal --Self-Efficacy	.77*	.73*	.82*	.83*	.82*	.78*	.83*	.83*
3. Performance-Approach Goal --Self-Efficacy	.73*	.51*	.73*	.57*	.77*	.63*	.76*	.52*
4. Performance-Avoidance Goal --Self-Efficacy	.05	.02	.31*	.08	.34*	.12	.25*	.23*
5. Task Goal --Task-Value	.77*	.85*	.73*	.95*	.64*	.88*	.79*	.94*
6. Performance-Approach Goal --Task-Value	.62*	.44*	.57*	.59*	.86*	.63*	.60*	.52*
7. Performance-Avoidance Goal --Task-Value	.04	.16	.17*	.16	.34*	.06	.25*	.13
8. Task Goal --Performance-Approach Goal	.64*	.51*	.73*	.57*	.70*	.69*	.69*	.61*
9. Task Goal --Performance-Avoidance Goal	.17*	-.02	.32*	.01	.32*	-.01	.30*	.14
10. Performance-Approach Goal--Performance-Avoidance Goal	.18*	.33*	.54*	.39*	.39*	.35*	.52*	.57*

* $p < .05$.

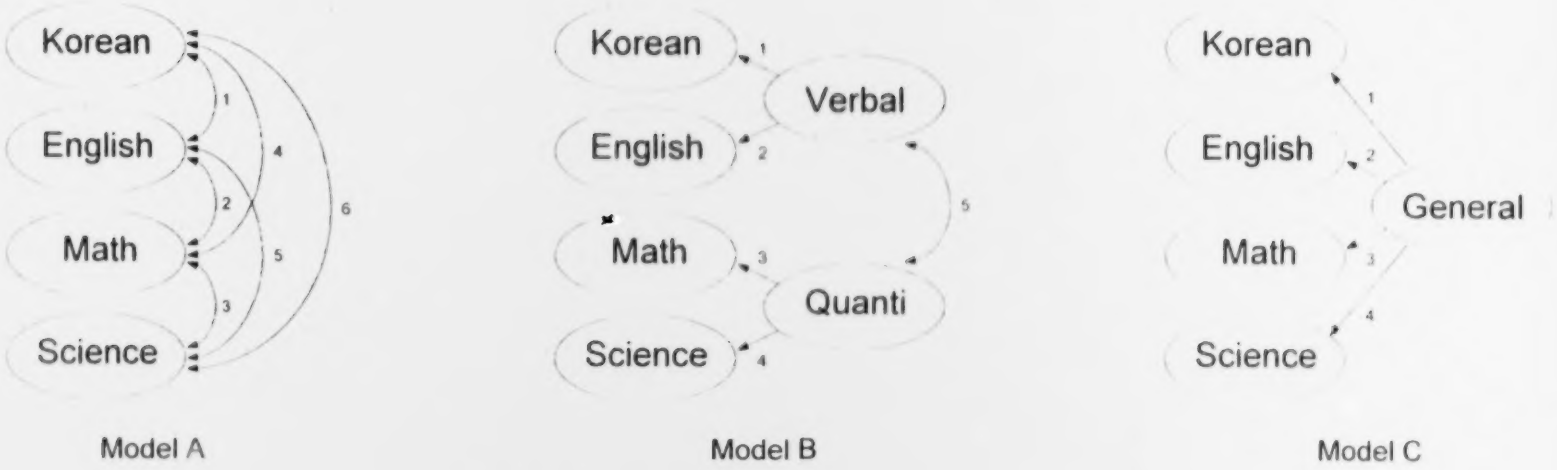

Figure 1. Structures of first- and second-order cross-domain confirmatory factor analysis models.